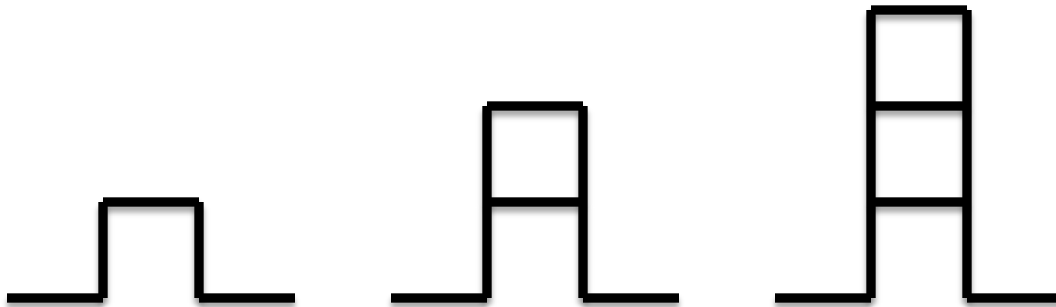


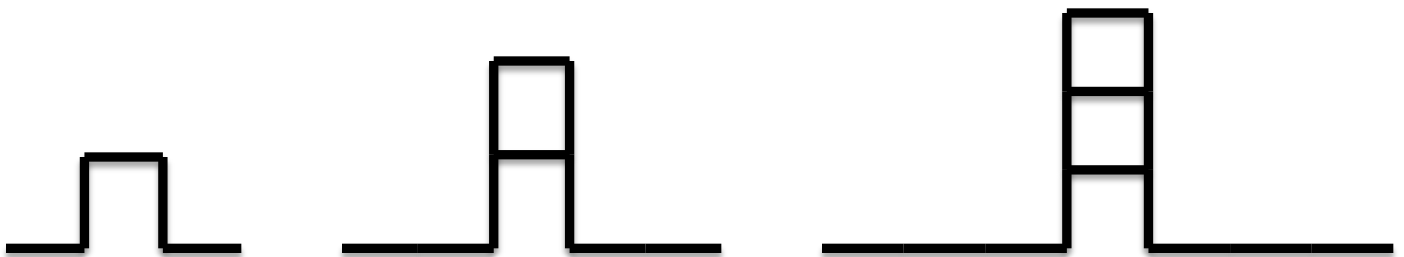
# The Toothpick Towers Problem (Tabach and Friedlander)

This figure represents two sequences of growing toothpick towers.

First sequence of towers:



Second sequence of towers:



1. Find the number of toothpicks for the fourth, fifth, and tenth “tower” in each sequence.
2. Generalize: How many toothpicks are in the  $n$ th “tower” of each sequence?
3. Find the place of the “tower” made of 35 toothpicks in each sequence.

4. Anne found that the number of toothpicks in the second tower of the first sequence is  $3 \cdot 2 + 2$ . She thought that “Three 2s and another 2 are the same as  $4 \cdot 2$ , and therefore, the number of toothpicks on the  $n$ th tower should be  $4 \cdot n$ . Explain Anne’s mistake.
5. Rachel found that the number of toothpicks in the  $n$ th tower is  $2 + 3 \cdot n$  for the first and  $5 \cdot n$  for the second sequence. She wondered “How can I get two equivalent expressions for two different sequences?” How would you respond to Rachel?